

What Is Claimed Is

1. A display method for a navigation system, comprising the following steps of:

5 reading out map data from a map data storage for displaying a map image on a screen of a navigation system;

10 converting the map data to screen coordinates so that an intended map image is displayed on a correct position on the screen;

15 zooming the map image by enlarging or shrinking distances of points on the map image relative to a center of the screen; and

20 storing the map data converted to the screen coordinates in a memory for use with a further operation of changing the map scale.

25 2. A display method for a navigation system as defined in Claim 1, further comprising the step of:

20 reading out the map data from the memory and multiplying a map scale value which is larger than one, thereby enlarging the map image on the screen.

30 3. A display method for a navigation system as defined in Claim 1, further comprising the step of:

25 reading out the map data from the memory and multiplying a map scale value which is smaller than one, thereby shrinking the map image on the screen.

35 4. A display method for a navigation system as defined in Claim 3, further comprising the step of:

30 reading out additional map data from the map data storage when the map data stored in the memory is insufficient.

35 5. A display method for a navigation system as defined in Claim 3, further comprising the steps of:

35 reading out additional map data from the map data storage when the map data stored in the memory is insufficient;

converting the additional map data with respect to the screen coordinates;

combining the map data from the memory and the converted additional map data; and

5 displaying the map image encompassing a larger area than that covered by the original map image.

6. A display method for a navigation system as defined in Claim 1, wherein said memory is a buffer memory or a map memory that is able to temporarily store the map data retrieved from the map data storage.

10 7. A display method for a navigation system as defined in Claim 1, wherein said map data storage is a CD-ROM (compact disc read only memory), DVD (digital versatile disc), or a hard disc which stores map information for conducting 15 operations for the navigation system.

8. A display method for a navigation system as defined in Claim 1, wherein said step of zooming the map image includes a step of positioning an area of interest on the map image to the center of the screen.

20 9. A display method for a navigation system as defined in Claim 1, further comprising the steps of:

positioning an area of interest on the map image to the center of the screen;

25 zooming-in the map image to a degree that new information for selecting a destination is displayed on the screen; and

selecting the destination using the new information on the screen to calculate a route to the destination.

10. A display method for a navigation system as defined 30 in Claim 9, wherein said new information includes POI (point of interest) icons showing positions and categories of POIs on the screen.

11. A display apparatus for a navigation system, comprising:

means for reading out map data from a map data storage for displaying a map image on a screen of a navigation system;

5 means for converting the map data to screen coordinates so that an intended map image is displayed on a correct position on the screen;

means for zooming the map image by enlarging or shrinking distances of points on the map image relative to a center of the screen; and

10 means for storing the map data converted to the screen coordinates in a memory for use with a further operation of changing the map scale.

12. A display apparatus for a navigation system as defined in Claim 11, further comprising:

15 means for reading out the map data from the memory and multiplying a map scale value which is larger than one, thereby enlarging the map image on the screen.

13. A display apparatus for a navigation system as defined in Claim 1, further comprising:

20 means for reading out the map data from the memory and multiplying a map scale value which is smaller than one, thereby shrinking the map image on the screen.

14. A display apparatus for a navigation system as defined in Claim 13, further comprising:

25 means for reading out additional map data from the map data storage when the map data stored in the memory is insufficient.

15. A display apparatus for a navigation system as defined in Claim 13, further comprising:

30 means for reading out additional map data from the map data storage when the map data stored in the memory is insufficient;

means for converting the additional map data with respect to the screen coordinates;

means for combining the map data from the memory and the converted additional map data; and

means for displaying the map image encompassing a larger area than that covered by the original map image.

5 16. A display apparatus for a navigation system as defined in Claim 11, wherein said memory is a buffer memory or a map memory that is able to temporarily store the map data retrieved from the map data storage.

10 17. A display apparatus for a navigation system as defined in Claim 11, wherein said map data storage is a CD-ROM (compact disc read only memory), DVD (digital versatile disc), or a hard disc which stores map information for conducting operations for the navigation system.

15 18. A display apparatus for a navigation system as defined in Claim 11, wherein said means for zooming the map image includes means for positioning an area of interest on the map image to the center of the screen.

19. A display apparatus for a navigation system as defined in Claim 11, further comprising:

20 means for positioning an area of interest on the map image to the center of the screen;

means for zooming-in the map image to a degree that new information for selecting a destination is displayed on the screen; and

25 means for selecting the destination using the new information on the screen to calculate a route to the destination.

20. A display apparatus for a navigation system as defined in Claim 19, wherein said new information includes POI (point of interest) icons showing positions and categories of POIs on the screen.